

GIS activities in Iowa began in 1986 and are concentrated in the Department of Natural Resources (DNR). Since 1989, DNR has led statewide geographic information and GIS coordination activities, including assisting in the formation of two coordinating groups. The Iowa Geographic Information Consortium is a statewide users group including state agencies, universities, local governments, federal agencies, and private companies. The Iowa Geographic Information Advisory Committee, including representatives of state agencies, is helping develop a statewide approach and direction for GIS coordination. The DNR, Department of Transportation, and Iowa Utilities Board are involved in a project titled *GIS Database for Energy Planning* supported by the U.S. Department of Energy, with a purpose of improving energy efficiency and energy development in Iowa. These agencies and the Department of Education are actively involved in statewide coordination.

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Origins of State Initiatives

GIS activities in Iowa began in the Department of Natural Resources (DNR) in 1986, and statewide coordination activities are currently led by this agency. DNR's GIS activities became official and department-wide after the legislature adopted the *Groundwater Protection Act* in 1987. This act was adopted to "establish measures to improve and protect groundwater quality and to manage substances which pose health and safety hazards." It directed the DNR, in cooperation with soil district commissioners and other state and local agencies, to develop and administer a comprehensive groundwater monitoring network, complete groundwater hazard mapping of the state and make the results available to state and local planning organizations by July 1, 1991, establish a system or systems within the department for collecting, evaluating and disseminating groundwater quality data and information, and develop and maintain a natural resource GIS and comprehensive water resource data system with data and information accessible and disseminated to the public to the greatest extent possible.

In response to the Groundwater Act, a Geographic Information Task Unit was formed in 1987 to develop a department-wide plan for establishing a Natural Resource Geographic Information System (NRGIS). This unit was formed from representatives of the seven program divisions of the DNR. The Task Unit developed a plan titled *A Preliminary Plan for Implementation of a GIS* in March, 1988. The GIS plan was reviewed and subsequently adopted by DNR's leadership. Upon their request, the GIS Unit prepared the *Proposed Division Implementation Plans for a Natural Resources GIS (NRGIS)*, on April 29, 1988. The DNR had requested this plan be developed in detail under the leadership of the Coordination and Information Division (CID) in response to the March plan. Following these plans, a GIS Coordinator position was established in CID to facilitate agency-wide coordination.

In 1989, the legislature added a subsection to the statutes concerning counties and municipalities titled *An act relating to the establishment and financing of geographic data base systems by cities and counties*. This legislation was adopted at

the encouragement of the Central Iowa Mapping Project, conducted by Polk County, the City of DeMoines and utilities in the area. The participants were concerned about the demand for data produced by the project. The act provided that "a government body which maintains a geographic computer database is not required to permit access to or use of the database by any person except upon terms and conditions acceptable to the governing body." It directs that "reasonable rates and procedures for the retrieval of specified records" be established.

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Coordination Efforts, Groups and Activities

The Department of Natural Resources (DNR) was directed in the *Iowa Groundwater Protection Act of 1987* to develop a natural resource GIS and comprehensive water resource data system. The DNR adopted a department-wide GIS plan in 1988, and three internal GIS coordinating groups, the GIS Policy Committee, the GIS Technical Advisory Committee and the GIS Users Group exist to facilitate coordination. DNR's Coordination and Information Division (CID) is responsible for ensuring agency-wide GIS coordination.

Statewide GIS coordination activities exist informally under the leadership of the DNR. Two informal geographic information and GIS groups exist on a statewide level, but no state resources are dedicated for statewide coordination. The Iowa Geographic Information Consortium serves as a users group, meeting informally since July, 1989. It includes state agencies, universities, local governments, federal agencies, and private companies. The group's first large meeting was held in December, 1989. The primary goal of the group is networking and information exchange, though the consortium is quite informal at this time. It is anticipated that a newsletter will be produced in the future.

The Iowa Geographic Information Advisory Committee was formed in November, 1990. It is composed of representatives of state agencies, including DNR, the Departments of Education, Economic Development, Transportation, the State Library, the Iowa Utilities Board, and Legislative Service Bureau. The Committee meets monthly, and is working to determine a method to develop a statewide direction and approach for geographic information coordination. One of the major concerns is the need for dedicated funding, as none exists at this time. Efforts include discussion about possible legislation or the need for a legislative study committee.

The committee drafted an executive order to

create a council with the purpose of helping to lead and coordinate geographic information and GIS in state agencies. It is envisioned the role of the council would be to establish standards and "coordinate policies, planning and direction of state GIS and determine agency responsibilities for managing and operating coordinated systems, . . . and guidelines as to data ownership and the degree to which that data can and will be shared between agencies." DNR's GIS Coordinator has served as a lead for both groups.

The DNR has implemented some standards for digital data development for GIS. Efforts are underway to develop a catalog of DNR projects and data including status maps. The draft data dictionary was completed in December, 1991 and includes a variety of information for each data layer in the DNR's system. Information about each coverage will include a description, source, file format, grid dimension, cell size, map projection, geographic control, and associated files and coverages.

The DNR and other agencies are developing digital data layers for GIS. The Department of Transportation acquired statewide DLG coverage at the 1:100,000 scale from the U.S. Geological Survey for boundaries, hydrography and transportation. The DNR is developing additional statewide layers at 1:100,000 including soils, land cover, public land survey system, and TIGER files. Additional layers are being developed for project areas, such as natural areas and air quality. Some projects are developing data at the 1:24,000 scale as needed.

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GIS in State Government

The **Department of Natural Resources** (DNR) is responsible for virtually all natural resources and environmental programs in the state. The DNR has been in the process of developing GIS since 1987 in response to the *Iowa Groundwater Protection Act*, adopted in 1987. The DNR's Coordination and Information Division (CID) has been responsible for coordinating GIS in the agency since GIS plans were adopted in 1988. A GIS Coordinator position was also established in 1988.

DNR's annual budget for GIS is approximately \$260,000, with over half of the support from the federal government. An additional \$500,000 was provided to the DNR and Department of Transportation (DOT) by the U.S. Department of Energy for the project entitled *GIS Database for Energy Planning*. DNR has five full-time staff members for GIS, including the GIS Coordinator.

An additional 20 DNR staff members spend an average of 10% on GIS activities.

DNR's original GIS project goal was groundwater and natural resources, as required by the *Groundwater Protection Act*. GIS are used in all eight divisions of the DNR for a variety of purposes. DNR currently has pcARC/INFO on eight personal computers, and EPPL7 on 25 personal computers. The largest users of GIS are in Coordination and Information (CID), Environmental Protection, and Energy and Geologic Resources Division. GIS activity is also occurring in the Forestry Division, Parks and Preserves Division, Fish and Wildlife Division, Waste Management Division, and Administrative Services. Across the DNR, applications include environmental impact statements, master planning, land cover analysis, groundwater vulnerability, wetlands, wildlife habitat including development of the breeding bird atlas, coal resource mapping, surface water monitoring, wells and underground storage tanks.

The Department of Natural Resources was directed in the Iowa Groundwater Protection Act of 1987 to develop a natural resource GIS and comprehensive water resource data system.

DNR is also working with the Department of Transportation (DOT) and the Iowa Utilities Board on a two year project titled *GIS Database for Energy Planning* that is funded by the U.S. Department of Energy's Oil Overcharge funding. The project was initiated to develop interagency cooperation through "complimentary roles in developing compatible digital data sets, sharing digital geographic resource information, and applying data to applications that both DNR and DOT use in their energy-related programs." The ultimate goals of the project are better energy efficiency, planning, decision making and development in Iowa.

Half of the energy project funds are being used by DOT to increase energy efficiency and transportation planning, and the other half is being used by DNR to acquire and analyze Landsat satellite imagery to produce a land cover map to identify potential biomass energy sources. DNR is also using some of this funding to digitize pipelines in cooperation with the Iowa Utilities Board. Three databases will be developed, including the Land cover/use Statewide Database to identify forest cover available for use as an alternative energy supply, Coal and Mineral Resources Data-

base to improve coal resource evaluation and utilization, and Energy Resources Database to provide energy data layers included in the energy resources inventory atlas to be published by the DNR.

The **Department of Transportation** (DOT) is developing an information management system that supports the integration and analysis of intra-agency and interagency information needed to make sound management decisions affecting economic development and transportation energy consumption while considering environmental and land use issues. This system will ensure that information from DNR and other agencies can be incorporated into management of the transportation network while ensuring access to DOT information by other agencies. The DOT has used an Intergraph system for automated cartography, and design and drafting since 1986. It also acquired the same 1:100,000 scale DLG data from the U.S. Geological Survey that is used by DNR. The DOT and DNR are working together on the project titled *GIS Database for Energy Planning* that is funded by the U.S. Department of Energy (see DNR).

Iowa's **Department of Education** is considering GIS for educational planning and delivery applications such as school transportation and redistricting. The department and the State Library sponsored a workshop titled "GIS for Educational Planning and Delivery" on November 28, 1990. The department has an active role in statewide coordination activities.

The **Iowa Utilities Board** is working with the DNR and DOT on the *GIS Database for Energy Planning* that is funded by the U.S. Department of Energy. DNR is using some of its portion of this funding to digitize pipelines in cooperation with the Board. One of the databases to be developed in the project will be the Energy Resources Database that will provide information for the energy resources inventory atlas (see DNR).

Academic Activities

Iowa State University and the **University of Iowa** are also actively involved in GIS activities. Iowa State University is digitizing soils data with the U.S. Soil Conservation Service and the Iowa Department of Agriculture on a cooperative project with the university's Land Use Analysis Lab. A variety of software packages are used by departments of the universities.

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Documents List

Directives

Iowa House File 675, An act relating to the establishment and financing of geographic database

systems by cities and counties, 1989.

This House File added a one-page subsection to the statutes providing that "a government body which maintains a geographic computer database is not required to permit access to or use of the database by any person except upon terms and conditions acceptable to the governing body. The governing body shall establish reasonable rates and procedures for the retrieval of specified records, which are not confidential records, stored in the database upon the request of any person."

Iowa House File 631, Groundwater Protection Act, 1987.

This act was adopted to "establish measures to improve and protect groundwater quality and to manage substances which pose health and safety hazards, by establishing goals, policies, funding mechanisms, including taxes and fees, and administrative provisions for the measures, by establishing programs relating to the management of agricultural activities, solid waste, household hazardous wastes, storage tanks, fertilizers, pesticides, landfills, and watersheds." It directed that the director of the Department of Natural Resources (DNR) shall, in cooperation with soil district commissioners and other state and local agencies, develop and administer a comprehensive groundwater monitoring network, complete groundwater hazard mapping of the state and make the results available to state and local planning organizations by July 1, 1991, establish a

system or systems within the department for collecting, evaluating and disseminating groundwater quality data and information, and develop and maintain a natural resource GIS and comprehensive water resource data system with data and information accessible and disseminated to the public to the greatest extent possible.

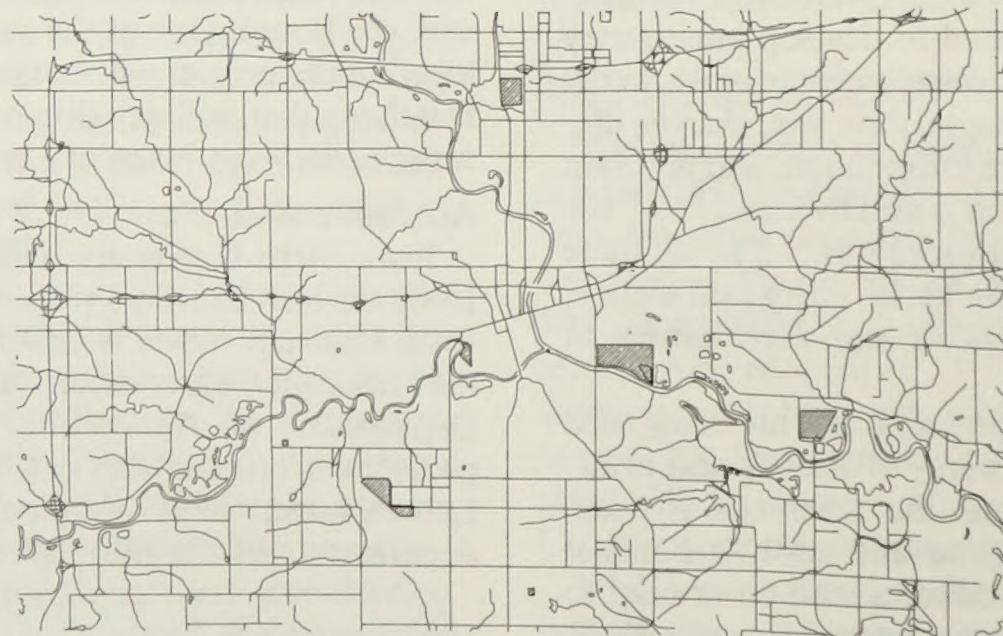
A Preliminary Plan for Implementation of a GIS, Department of Natural Resources, Geographic Information Task Unit Report, March 1, 1988.

The plan suggests that a department-wide system is needed, but rather than a centralized one, that it be initially based on personal computers. It includes proposed applications, potential benefits, user and data needs, program priorities, institutional arrangements, personnel, software, hardware and costs. The plan projected that the cost would be \$4.5 million over six years.

Proposed Division Implementation Plans for a Natural Resources GIS (NRGIS), Department of Natural Resources, Geographic Information Task Unit Report, April 29, 1988.

The DNR requested this plan be developed in detail under the leadership of the Coordination and Information Division of the Planning Branch in response to the March, 1988 plan. It also requested coordination with the GIS Energy Demonstration project being funded by oil overcharge monies, as well as a need for commitment by each division. It also resulted in a prioritization of projects.

Uncontrolled Sites in the Des Moines, Iowa Area



Data for this map was generated by two Iowa State Departments; the Department of Natural Resources (DNR) and the Department of Transportation (DOT). The DNR digitized the outlines of the uncontrolled sites from 1:24,000 scale topographic maps using pcARC/INFO. The DOT purchased the USGS 1:100,000 scale Digital Line Graph (DLG) data and put it into their Intergraph system. To put the two sets of data into one system, the DOT transferred their data into Autocad DXF format so the DNR could import the DXF data into pcARC/INFO.